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WHITHAM, CURTIS & CHRISTOFFERSON, P.C.  
11491 SUNSET HILLS ROAD  
SUITE 340  
RESTON, VA 20190

EXAMINER

LOKE, STEVEN HO YIN

ART UNIT PAPER NUMBER

2811

DATE MAILED: 11/12/2002

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

09/486,779

Applicant(s)

HUANG, ALEX Q.

Examiner

Steven Loke

Art Unit

2811

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 23 August 2002.
- 2a) ☒ This action is FINAL. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-44 is/are pending in the application.
- 4a) Of the above claim(s) 10-18 is/are withdrawn from consideration.
- 5) ☒ Claim(s) 23, 24 and 26-31 is/are allowed.
- 6) ☒ Claim(s) 1-6, 8, 32-38 and 40-44 is/are rejected.
- 7) ☒ Claim(s) 7, 9, 19-22, 25 and 39 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☒ The proposed drawing correction filed on 23 August 2002 is: a) ☒ <sup>partially</sup> approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

**Priority under 35 U.S.C. §§ 119 and 120**

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

**Attachment(s)**

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) \_\_\_\_\_
- 4) ☐ Interview Summary (PTO-413) Paper No(s). \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_

Art Unit: 2811

1. The proposed drawing correction and/or the proposed substitute sheets of drawings, filed on 8/23/02 has been received. The proposed drawing changes of figs. 1A, 1C, 8A, 9A, 9B, 10A, 10B, 11A, 11B, 12A, 12B, 13A, 13B, 15B, 16B, 17B, 18 and 19 are acceptable. A proper drawing correction or corrected drawings are required in reply to the Office action to avoid abandonment of the application. The correction to the drawings will not be held in abeyance.
2. The drawings are objected to because it is unclear why reference numeral 78 is used to describe NMOS2 in amended fig. 4. Reference numeral 78 is used to describe the gate (page 9, line 19). There is no description for reference numeral 78 in fig. 4A. In amended drawings 14A and 14B, it is unclear whether the circuit of PMOS [234] of fig. 14B is similar to the circuit of the PMOS [234] in fig. 14A. It is also unclear whether the circuit of the PMOS [236] of fig. 14B is similar to the circuit of the PMOS [236] of fig. 14A. There is no P base 74 (page 9, line 18) in fig. 3A. A proposed drawing correction or corrected drawings are required in reply to the Office action to avoid abandonment of the application. The objection to the drawings will not be held in abeyance.
3. Claims 1, 19, 22, 25, 32, 33, 39, 40, 41 and 42 are objected to because of the following informalities:
  - Claim 1, line 19, claim 33, line 16, "said latching state" has no antecedent basis.
  - Claim 19, line 16, "said ETO device package", lines 27-28, "said emitter controlled thyristor device" have no antecedent basis.
  - Claim 32, line 2, "said MOS switching device", line 6, "said second feedback path" have no antecedent basis.

Art Unit: 2811

Claim 39, line 2, claim 22, lines 2-3, claim 40, line 2, claim 41, line 2, "said first and second switches" has no antecedent basis.

Claim 25, line 3, "and anode" is unclear whether it is being referred to "an anode".

Claim 33, line 8, "as second semiconductor switch" is unclear whether it is being referred to "a second semiconductor switch".

Claim 33, lines 21-22, "... applied said" is unclear whether it is being referred to "... applied to said".

Claim 42, lines 2-3, "MOS transistor" is unclear whether it is being referred to "a MOS transistor".

Appropriate correction is required.

4. Claims 40-44 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 19 discloses first and second MOS transistors as the switches. It is unclear how the first and second switches can also be a diode at the same time as claimed in claims 40 and 41.

Claim 33 discloses an emitter turn-off thyristor device. Claim 33 never discloses a GTO device package as claimed in claims 42-44.

5. Claims 33-38 and 40-44 are rejected under 35 U.S.C. 112, first paragraph, as containing subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention.

Art Unit: 2811

The specification never discloses an emitter turn-off thyristor device having the first and second semiconductor switches are arranged such that a signal of a first type applied to the first and second electronic switches turn said emitter turn-off thyristor to an on-state and a signal of a second type applied to said first and second electronic switches turn said emitter turn-off thyristor to an off-state as claimed in claim 33.

Fig. 18 discloses the transistor  $Q_2$  can act like a Zener diode. The specification never discloses the first switch is a diode as claimed in claims 40 and 43.

The specification never discloses the first switch is a zener diode as claimed in claims 41 and 44.

6. Claim 32 rejected under 35 U.S.C. 112, first paragraph, as containing subject matter which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention.

The specification never discloses how a capacitor connected in parallel to said second feedback path connecting the gate terminal of said MOS transistors to said thyristor gate terminal through a diode as claimed in claim 32.

7. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in a patent granted on an application for patent by another filed in the United States before the invention thereof by the applicant for patent, or on an international application by another who has fulfilled the requirements of paragraphs (1), (2), and (4) of section 371(c) of this title before the invention thereof by the applicant for patent.

The changes made to 35 U.S.C. 102(e) by the American Inventors Protection Act of 1999 (AIPA) do not apply to the examination of this application as the application being examined was not (1) filed on or after November 29, 2000, or (2) voluntarily published under 35 U.S.C. 122(b). Therefore, this application is examined under 35 U.S.C. 102(e) prior to the amendment by the AIPA (pre-AIPA 35 U.S.C. 102(e)).

8. Claims 1-6, 8 and 33, 34, 37 and 42 insofar, as in compliance with 35 USC 112, are rejected under 35 U.S.C. 102(e) as being clearly anticipated by Schlangenotto.

In regards to claims 1-6, 8 and 33, 34, 37, 42, Schlangenotto shows all the elements of the claimed invention in figs. 1-3. It comprises: a p-type substrate [1]; a n-type base [2] and a p-type base [3] formed on the substrate; an n-type region [4] formed on the base [3]; p-type regions [5a, 5b] formed on the n-type region [4]; an insulated gate [G] of the MOSFET M1 (first MOS transistor) formed between the p-type regions [5a, 5b]; a cathode electrode [K] formed on the p-type region [5b] and connected to the insulated gate of the MOSFET M2 (second MOS transistor); a floating cathode metal [K] formed on the p-type region [5a] and the n-type region [4]; a MOSFET M3 (third MOS transistor) formed on the regions [2, 3, 4]. A first voltage applied to a gate terminal of the first MOS transistor causes a forward current to flow between the cathode terminal and the anode terminal turning the thyristor device to an on state, and a zero voltage applied to the gate of the first MOS transistor turns the thyristor device to an off state (col. 4, lines 42-55). The floating cathode metal [K] injects electrons into the thyristor for triggering the thyristor into a latching state.

Art Unit: 2811

9. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

10. Claims 35, 36, 38, 43 and 44 are rejected under 35 U.S.C. 103(a) as being unpatentable over Schlangenotto.

In regards to claim 35, Schlangenotto differs from the claimed invention by not showing the thyristor device and the first and second semiconductor switches are formed as discrete devices. It would have been obvious for the thyristor device and the first and second semiconductor switches are formed as discrete devices because it depends on the size of the overall device.

In regards to claim 36, Schlangenotto differs from the claimed invention by not showing the thyristor device and the first and second semiconductor switches are commonly packaged. It would have been obvious for the thyristor device and the first and second semiconductor switches are commonly packaged because it depends on the size of the overall device.

In regards to claim 38, Schlangenotto differs from the claimed invention by not showing at least one of the first and second semiconductor switches is constituted by a plurality of semiconductor devices. It would have been obvious for at least one of the first and second semiconductor switches is constituted by a plurality of semiconductor devices because it depends on the amount of current flow into the thyristor.

Art Unit: 2811

In regards to claim 43, Schlangenotto differs from the claimed invention by not showing the second switch is a diode. It would have been obvious for the second switch is a diode because it has a function similar to that of a gate-source connected MOSFET.

In regards to claim 44, Schlangenotto differs from the claimed invention by not showing the second switch is a zener diode. It would have been obvious for the second switch is a zener diode because it has a function similar to that of a gate-source connected MOSFET.

11. Applicant's arguments filed 8/23/02 have been fully considered but they are not persuasive.

It is urged, in pages 10-12 of the remarks, that the emitter controlled thyristor and emitter turn-off thyristor are electrically similar and there is no serious burden would exist in consideration of the ETO embodiments and packages beyond consideration of claims to ECTs and GTO packages. However, the device structures of the ETO embodiments are different from that of the ECTs. Therefore, different class and/or subclass search would be require for ETO embodiments. There would be serious burden to the examiner to examine the claims of the ETO embodiments and the claims of the ECTs.

It is urged, in page 14 of the remarks, that Schlangenotto does not teach or suggest particular features of configuration or packaging or additional electrical elements of other embodiments now claimed in claims 1 and 33 in a manner generic to all other disclosed embodiments of the invention. However, the above rejection does show the



Art Unit: 2811

claimed configuration and electrical elements as claimed in claims 1 and 33 and claims depending therefrom. Since claims 10-18 are non-elected claims, the Examiner will not apply a prior art rejection for the non-elected claims.

12. Claims 19-22 and 39 would be allowable if rewritten or amended to overcome the objection set forth in this Office action.

13. Claims 23, 24, 26-31 are allowed.

14. Claims 7 and 9 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

15. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP

§ 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.

Art Unit: 2811

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Steven Loke whose telephone number is (703) 308-4920. The examiner can normally be reached on 7:50 am to 5:20 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Tom Thomas can be reached on (703) 308-2772. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 308-7722 for regular communications and (703) 308-7722 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0956.

sl  
November 8, 2002

A handwritten signature in cursive script, appearing to read "Steven Loke".